

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 09-095745

(43)Date of publication of application : 08.04.1997

(51)Int.CI.

C22C 1/05
C22C 9/00

(21)Application number : 07-279767

(22)Date of filing : 03.10.1995

(71)Applicant : HITACHI METALS LTD

(72)Inventor : HAMAYOSHI SHIGEYUKI
OSHIMA MASAHIKO
SUWABE HIROHISA

(54) LOW THERMAL EXPANSION-HIGH THERMAL CONDUCTIVITY COPPER COMPOSITE MATERIAL AND ITS PRODUCTION

(57)Abstract:

PROBLEM TO BE SOLVED: To produce a low thermal expansion-high thermal expansion copper composite material by subjecting a powdery mixture composed of specified ratios of copper powder and silicon carbide powder to press sintering.

SOLUTION: By volume, 20 to 80% silicon carbide powder is added to 80 to 20% copper powder, which are mixed, and press sintering is executed at 600 to 950° C under $\geq 1,000\text{kg/cm}^2$ pressure. Thus, the copper composite material whose thermal expansion coefficient is regulated to 5×10^{-6} to $14 \times 10^{-6}/\text{K}$ and thermal conductivity to 150 to 380W/(m.K) can be obt. Furthermore, preferably, the purity of the copper powder is regulated to ∞ 99%, the concn. of iron impurities therein to $\leq 0.001\%$, the purity of the silicon carbide powder to $\geq 99\%$, and the average grain size thereof to $\geq 10\mu$, respectively.

LEGAL STATUS

[Date of request for examination] 07.08.2002

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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